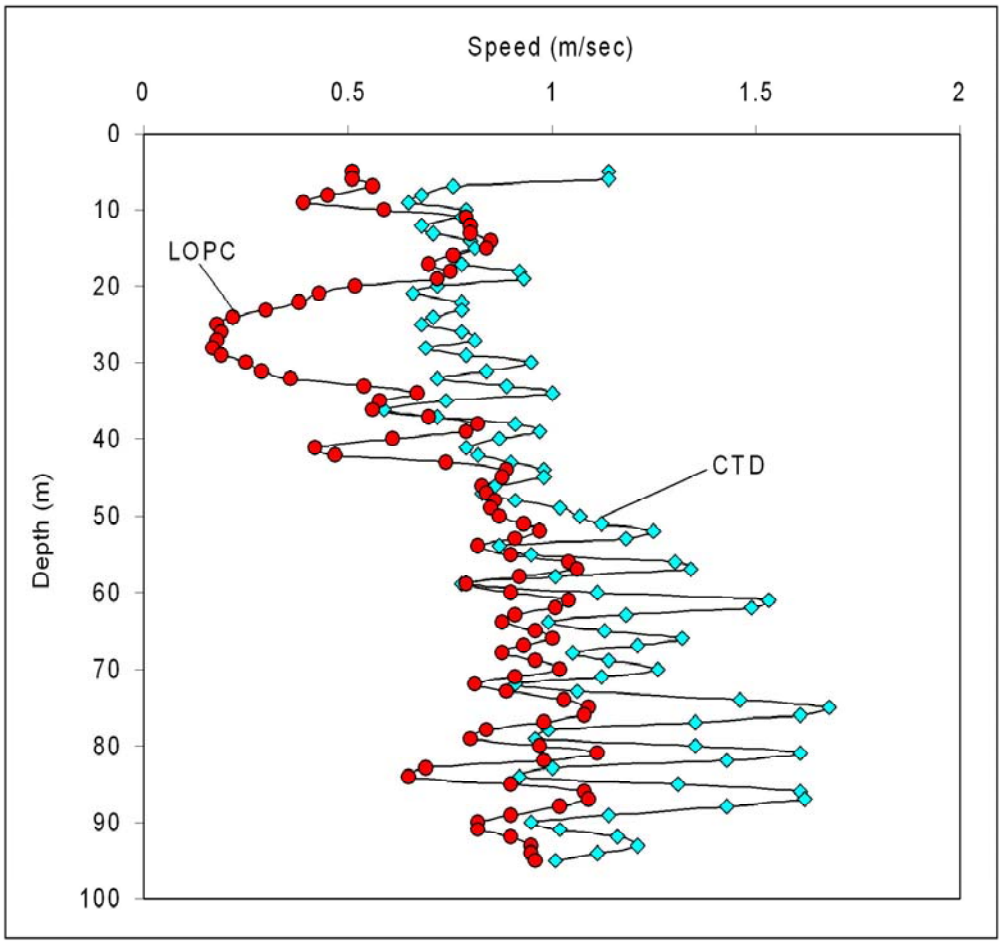
Errors in LOPC Flow Speeds - Notice to LOPC Users
Alex Herman – April 06

There are regions and periods where the LOPC flow speed algorithm fails presenting false data and these should be noted by LOPC users. I believe these false data are produced when encountering large transparent particles. These particles 'trip' the low threshold used for the flow calculation and subsequently spend a long time in the beam thereby extending the transit time measurement and decreasing the measured flow speed. Users should watch for this effect which occurs at times in the upper mixed layer. As an option, one should default to the estimated speed, either i) the CTD rates (dP/dt) for vertical tows, or ii) ships speed for towing.

I have observed this speed decrease during vertical net hauls which can sometimes be attributed to decreases in flow through the net when comparing to flow measured by a TSK flowmeter. However last Sept. we tested an LOPC mounted in a SOLO drifter which profiled from 100 m to surface at 20 cm/sec. The LOPC measured flow was stable from 100m depth to 50m on the way up but decreased dramatically from 50m depth to about 25m depth. CTD depth rates were constant throughout the entire profile and therefore it was highly likely that the flow remained constant throughout the LOPC tunnel.

Subsequent vertical tows (at 1 m/sec) were made with LOPC mounted inside a plankton net and again with the plankton net removed. The decrease in LOPC measured flow speed was the same in both cases. The figure below shows a comparison between the



CTD rates and LOPC flow speeds. Starting the vertical haul from 100m, the CTD rates were about 1 m/sec also showing some variations due to ship bounce. The LOPC tracked the flow speed reasonably well except in the depth region of 20-30m where a decrease was observed.

I will be testing some modifications to the flow speed algorithm sometime this fall and will keep users posted on progress.